Filters/Input	Filter Coefficients (in gray boxes)										
F_3					1	2	1				
F_5				1	2	3	2	1			
F_7			1	2	3	4	3	2	1		
F_9		1	2	3	4	5	4	3	2	1	
F_11	1	2	3	4	5	6	5	4	3	2	1
Input data	D_{-5}	D_{-4}	D_{-3}	D_{-2}	D_{-1}	D_0	D_1	D_2	D_3	D_4	D_5

FIG. 2

Filters/Input	1D-filter outputs (sum of data in gray boxes in row)										
F_1						D_0					
F_3					D_{-1}	$2D_0$	D_1				
F_5				D_{-2}	$2D_{-1}$	$3D_0$	$2D_1$	D_2			
F_7			D_{-3}	$2D_{-2}$	$3D_{-1}$	$4D_0$	$3D_1$	$2D_2$	D_3		
F_9		D_{-4}	$2D_{-3}$	$3D_{-2}$	$4D_{-1}$	$5D_0$	$4D_1$	$3D_2$	$2D_3$	D_4	
F_11	D_{-5}	$2D_{-4}$	$3D_{-3}$	$4D_{-2}$	$5D_{-1}$	$6D_0$	$5D_1$	$4D_2$	$3D_3$	$2D_4$	D_5
Input data	D_{-5}	D_{-4}	D_{-3}	D_{-2}	D_{-1}	D_0	D_1	D_2	D_3	D_4	D_5

FIG. 3

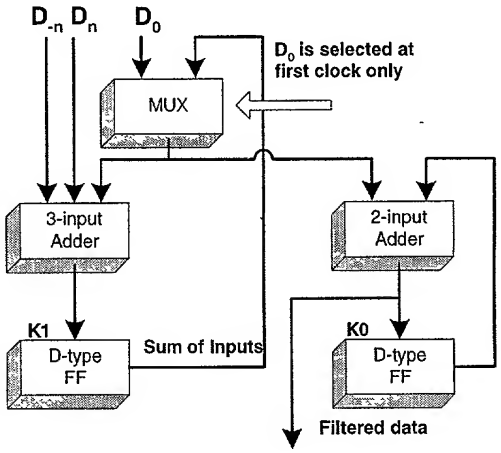

FIG. 6

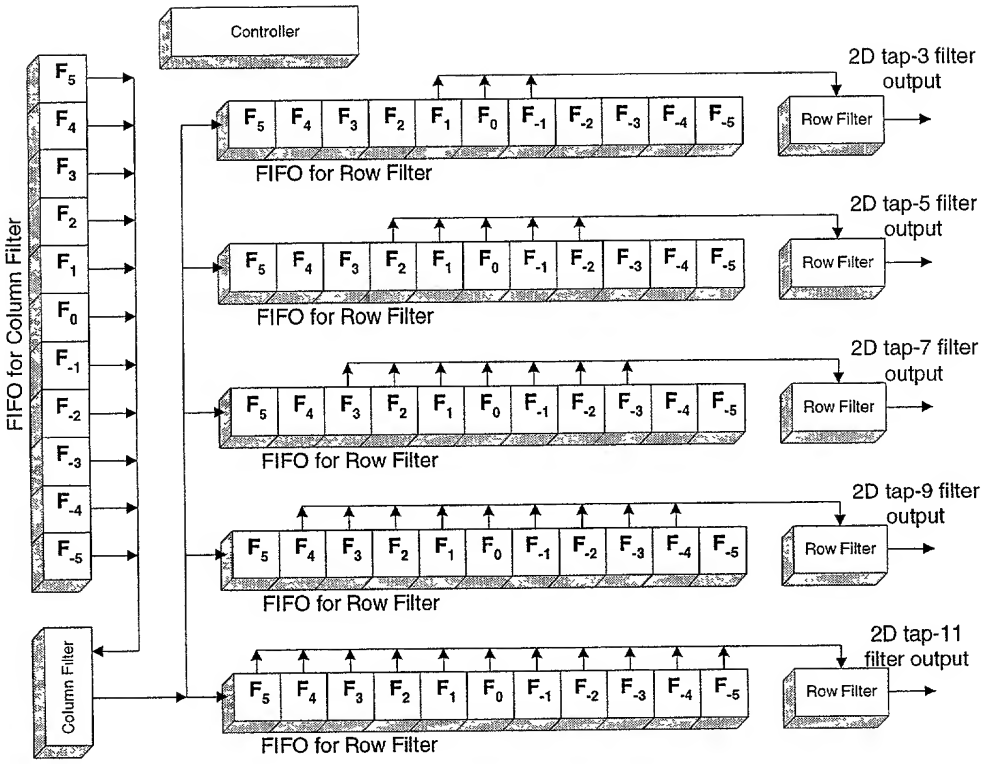

FIG. 5

FIFO Name	←← Data pushed this way										
FIFO 3	$K_{3,-5}$	$K_{3,-4}$	$K_{3,-3}$	$K_{3,-2}$	$K_{3,-1}$	$K_{3,0}$	$K_{3,1}$	$K_{3,2}$	$K_{3,3}$	$K_{3,4}$	$K_{3,5}$
FIFO 5	$K_{5,-5}$	$K_{5,-4}$	$K_{5,-3}$	$K_{5,-2}$	$K_{5,-1}$	$K_{5,0}$	$K_{5,1}$	$K_{5,2}$	$K_{5,3}$	$K_{5,4}$	$K_{5,5}$
FIFO 7	$K_{7,-5}$	$K_{7,-4}$	$K_{7,-3}$	$K_{7,-2}$	$K_{7,-1}$	$K_{7,0}$	$K_{7,1}$	$K_{7,2}$	$K_{7,3}$	$K_{7,4}$	$K_{7,5}$
FIFO 9	$K_{9,-5}$	$K_{9,-4}$	$K_{9,-3}$	$K_{9,-2}$	$K_{9,-1}$	$K_{9,0}$	$K_{9,1}$	$K_{9,2}$	$K_{9,3}$	$K_{9,4}$	$K_{9,5}$
FIFO 11	$K_{11,-5}$	$K_{11,-4}$	$K_{11,-3}$	$K_{11,-2}$	$K_{11,-1}$	$K_{11,0}$	$K_{11,1}$	$K_{11,2}$	$K_{11,3}$	$K_{11,4}$	$K_{11,5}$

FIG. 4

Implementations		Traditional 2D-filter Bank		Progressive 2D-filter Bank	
		General	M = 5	General	M = 5
Software	# of additions	$2M^2 + 2M$	60	**3M(M + 3)/2**	**60**
	# of multiplications	$2M^2 + 4M$	70	**0**	**0**
	# of computations	$4M^2 + 6M$	130	**3M(M + 3)/2**	**60**
Hardware	# of adders	2M	10	**2(M + 1)**	**12**
	# of multipliers	2M	10	**0**	**0**
	# of clocks **	(4M + 1)	21	**(M + 1)**	**6**

1. Assume that the adder or multiplier finishes one computation by only one clock .
2. A MAC contains one adder and one multiplier.

FIG. 7

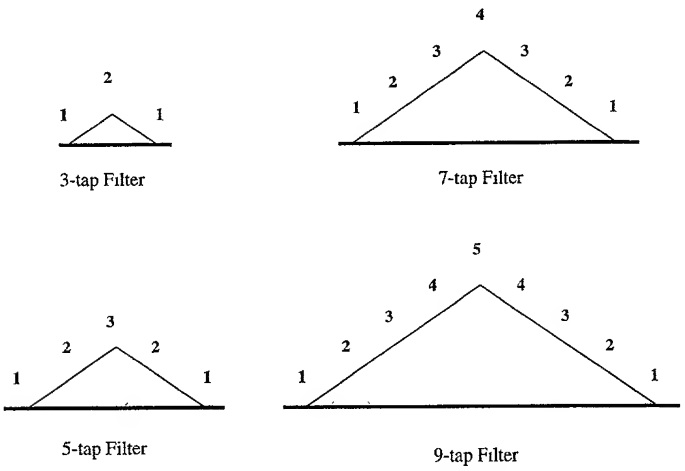

FIG. 1